

The Coming Blackout Epidemic

Written by **NAFEEZ AHMED**

November 17, 2014 // 12:00 PM EST

Industrialized countries face a future of increasingly severe blackouts, a new study warns, due to the proliferation of extreme weather events, the transition to unconventional fossil fuels, and fragile national grids that cannot keep up with rocketing energy demand.

"We need a fundamental re-think about how electricity is generated and distributed and who controls this," said lead author Prof Hugh Byrd of Lincoln University, a specialist in international energy policy and urban sustainability. "It is not in the interests of the privatized power industry to encourage less electricity consumption."

Every year, millions of people around the world experience major electricity blackouts, but the country that has endured more blackouts than any other industrialized nation is the United States. Over the last decade, the number of power failures affecting over 50,000 Americans has more than doubled (<http://www.ibtimes.com/aging-us-power-grid-blacks-out-more-any-other-developed-nation-1631086>), according to federal data.

THE LOOMING POWER FAILURE EPIDEMIC

The paper (<http://www.tandfonline.com/doi/full/10.1080/10630732.2014.940706>) published this September in Routledge's *Journal of Urban Technology* points out that 50 major power outages have afflicted 26 countries in the last decade alone, driven by rapid population growth in concentrated urban areas and a rampant "addiction" to high-consumption lifestyles dependent on electric appliances.

Study authors Hugh Byrd and Prof Steve Matthewman of Auckland University, a sociologist of disaster risk, argue that this escalating demand is occurring precisely "as our resources become constrained due to the depletion of fossil fuel, a lack of renewable energy sources, peak oil and climate change."

Blackouts, they warn, are "dress rehearsals for the future in which they will appear with greater frequency and severity," they find. "We predict increasing numbers of blackouts due to growing uncertainties in supply and growing certainties in demand."

The problem is that industrial era grids simply cannot keep up. Average electricity use by US households increased by 1300 percent from 1940 to 2001, and is forecast to rise by a further 22 percent over the next 20 years.

According to Byrd and Matthewman, we are in the midst of a proliferating, global blackout epidemic that is likely to worsen. "Throughout our study, we observed a number of network failures due to inadequate energy, whether through depletion of resources such as oil and coal, or through the vagaries of the climate in the creation of renewable energy," said Prof Byrd, who specializes in international energy policy and environmental performance in urban areas.

EXTREME WEATHER AND CLIMATE CHANGE

According to a little-known report (http://energy.gov/sites/prod/files/2013/08/f2/Grid%20Resiliency%20Report_FINAL.pdf) last year to the Executive Office of the President by the Council of Economic Advisers and Department of Energy, between 2003 and 2012 the US saw 679 blackouts due to extreme weather events, costing on average \$18-33 billion a year. In 2012 alone, the US suffered eleven "billion-dollar" (http://energy.gov/sites/prod/files/2013/08/f2/Grid%20Resiliency%20Report_FINAL.pdf) weather disasters.

"The number of outages caused by severe weather is expected to rise as climate change increases the frequency and intensity of hurricanes, blizzards, floods and other extreme weather events," the report found.

The growing prevalence of extreme weather including droughts due to climate change could also significantly undermine coal, gas and nuclear production, all of which require large inputs of water, to spin and cool turbines in thermal power plants.

The amount of fresh water consumed for world energy production could double (<http://news.nationalgeographic.com/news/energy/2013/01/130130-water-demand-for-energy-to-double-by-2035/>) in the next 25 years according to the International Energy Agency (IEA). In that fossil fuel-centric scenario, over 50 percent of demand would come from coal-fired power plants, 30 percent from biofuel production, and 10 percent from oil and natural gas production.

But as this year's UN World Water Development Report (<http://www.unwater.org/publications/publications-detail/en/c/218614/>) pointed out, the era of global fresh water scarcity is already here, with 20 percent of all aquifers having been overexploited. By mid-century, 2.3 billion people will be living in regions of severe water stress, which in turn will undermine the capacity to generate energy through traditional means.

Although fracking for gas is more efficient than coal in terms of water use, it is still deeply problematic, say critics. In an ongoing research project (<http://www.fracktracker.org/2014/10/water-energy-nexus-in-ohio/>), biogeochemist Dr Ted Auch of FracTracker Alliance shows that fracking in Ohio is likely exacerbating water challenges

(<http://www.zanesvilletimesrecorder.com/story/news/local/fracking/2014/06/14/report-fracking-water-use-could-lead-to-severe-droughts/10533627/>), and could in itself lead to drought. This is already happening in Texas (<http://www.theguardian.com/environment/2013/aug/11/texas-tragedy-ample-oil-no-water>) and California (<http://desmogblog.com/2014/08/01/fracking-making-california-s-drought-worse-say-activists>).

YOUR AIR CONDITIONER AND CLEAN CAR COULD BE KILLING THE GRID

One side-effect of higher temperatures due to climate change is a dramatic increase in energy use. As climate change brings warmer summers and more intense rains to regions of North America, people resort to more air-conditioning to stay cool.

Byrd and Matthewman point out that the US is currently “the undisputed champion” of air-conditioning, which accounts for a whopping 20 percent of the country’s domestic electricity consumption, and 13 percent of the commercial sector’s. This is equivalent to the entire electrical demand of Africa. By 2035, the use of air-conditioning in just the US commercial sector will rise by another 22 percent.

Worldwide, overall energy demand for air-conditioning “is projected to rise rapidly to 2100,” to as much as 40 times greater than it was in 2000. New York alone will need 40 percent more power (<http://www.wnyc.org/story/nyc-2050-greater-energy-demand/>) in the next 15 years partly because the city will contain a million more people, aided of course by electrical appliances, elevators, and air-conditioning.

But with the persistent rise of global primary energy costs, especially for oil as cheap conventional sources decline, the World Bank forecasts that by 2030, a smaller proportion of the world’s population will have access to electricity than do now.

BELGIUM IS ALREADY SET TO SELECTIVELY SWITCH OFF ELECTRICITY IN PARTS OF THE COUNTRY THIS WINTER

Adding further pressure to future electricity demand is the rise of the electric vehicle, driven by efforts to mitigate climate change. Byrd and Matthewman note that in higher-income regions, switching entirely to electric cars would increase electricity demand by 15-40 percent. Even if we replaced all our petrol-guzzling cars with “highly efficient” electric cars, the new models would still consume about “twice as much electricity as residential and commercial air-conditioning combined.”

Of course, there are precious few countries which have come anywhere near scaling up electric cars to a degree that could destabilize national grids, which are largely under threat from expensive fossil fuels and evermore frequent extreme weather episodes.

Byrd and Matthewman also concede that the demand challenge could be addressed, or at least mitigated, by upgrading the grid. A smart grid combined with better energy storage mechanisms could handle the intermittency and decentralized nature of renewable energy sources in a way that can overwhelm today’s industrial era grids.

But in a slow-growth global economy hell-bent on austerity, the prospects for large government investments in grid resilience look slim. According to the global insurance company Allianz in an extensive [report](https://www.allianz.com/v_1339677769000/media/responsibility/documents/position_paper_power_blackout_risks.pdf) (https://www.allianz.com/v_1339677769000/media/responsibility/documents/position_paper_power_blackout_risks.pdf) on blackout risks in the US and Europe, “privatization and liberalization” have contributed to “missing incentives to invest in reliable, and therefore well maintained, infrastructures.”

“Blackouts during the last ten years in Europe and Northern America have demonstrated an increasing likelihood of supra-regional blackouts with accompanying large economic losses,” Allianz [observed](http://www.agcs.allianz.com/assets/PDFs/GRD/GRD%20individual%20articles/Power_blackout_risks_article.pdf) (http://www.agcs.allianz.com/assets/PDFs/GRD/GRD%20individual%20articles/Power_blackout_risks_article.pdf). “Large-scale, supra-regional blackouts are increasingly a realistic scenario.”

POWER OVERHAUL

Byrd and Matthewman are thus hardly lone voices. Their research adds to a growing chorus of experts who foresee a dark future without overhauling power grids, securing stable, cleaner energy supplies, and reducing consumption.

By failing to upgrade power infrastructures, the shift to renewables can create new problems.

Belgium is already set to selectively switch off electricity in parts of the country this winter with its energy capacity at a low of 2 percent. The UK, at a seven-year low of just 4 percent capacity, is also cutting it fine. Similar concerns of blackouts or enforced power outages ('brownouts') have been raised for Germany, France and elsewhere in the EU.

A new report (<http://www.capgemini.com/resources/editorial-the-european-energy-markets-observatory-16th-edition>) by the French multinational technology firm CapGemini warns of a heightened risk of blackouts across Europe this winter due to the shut-down of gas-fired plants, competition from cheap US coal, and the big shift to wind and solar. Ironically, electricity surpluses from renewables have led to a fall in power prices and crippled fossil fuel utilities, which in turn has reduced the "electricity system's margin to meet peak demand in specific conditions such as cold, dark and windless days," according to the report (<http://www.capgemini.com/resources/editorial-the-european-energy-markets-observatory-16th-edition>).

The increasing, haphazard shift to renewable energy sources has therefore exacerbated the blackout risk not because renewables are bad at generating power, but because of the difficulty in integrating such volatile, decentralized energy sources into old power grids designed half a century ago around the old fossil fuel model.

FROM BLACKOUT TO BREAKDOWN?

The practical consequences of all this set out by Byrd and Matthewman sound like a checklist for the dystopian endgame. "Blackouts affect pumps, refrigeration, traffic lights, trains, and cell phone towers," all of which will therefore have "serious consequences for water, waste, food, transportation, and communication systems."

BLACKOUTS CAN LEAD TO MASSIVE ECONOMIC LOSSES, FOOD SUPPLY SHORTAGES, AND INCREASED CRIME

Surveying the impacts of past blackouts in the US, China, Canada, Italy, Africa, and many other regions, they show that blackouts can lead to state-rationing of electricity, massive economic losses, the breakdown of manufacturing, food supply shortages, degradation of water purification and waste facilities, and increases in crime rates and civil unrest. Yet they are not fatalistic about the inevitability of such an increasingly dark future.

"There is a possibility of mitigating, but not eliminating, the risk with improved technology," said Hugh Byrd. Major investments in self-healing 'smart grids' and 'smart metering' "can assist in reducing demand by providing feedback to users," but some technologies can also create new risks like "cyber-espionage of the control systems of generators and distributors."

Careful management will also be essential, according to Byrd: "The increased use of electric vehicles also needs managing carefully to avoid peak demands in evenings – recharging one EV is similar to the demand of about 4-5 houses."

Ultimately, though, the power sector as a whole will need a radical overhaul if we are to minimize the dangers. That means a combination of smart grids, decentralized renewables and much more modest consumption, Byrd told me: "There is a general trend emerging of the re-municipalisation of electricity supply. Distributed generation of electricity from renewable resources, as opposed to centralised, in a post-industrial society is an important issue."

Not everyone agrees, though, on the risk of blackouts. Prof Ugo Bardi, the author of a landmark Club of Rome report (<http://www.theguardian.com/environment/earth-insight/2014/jun/04/mineral-resource-fossil-fuel-depletion-terraform-earth-collapse-civilisation?view=mobile#opt-in-message>) this summer on the global depletion of cheap fossil fuel and mineral resources, dismissed the idea that the factors identified by Byrd and Matthewman would necessarily lead to increased blackouts:

"Interestingly, in Italy we had a major blackout in 2003, with the whole country without electricity for about 12 hours... At that time, a lot of people in Italy were expecting blackouts to become a big problem. They didn't. The 2003 blackout took place in a moment of rapid growth of electricity production but, later on, market factors forced a reduction in consumption, the pressure on the grid system was strongly reduced and no more blackouts were seen."

According to Bardi, this is the scenario playing out in the UK, where "electricity consumption peaked at around the same time as Italy—although in the UK peaking was not accompanied by blackouts."

Growth of global electricity production, Bardi told me, is undergoing "a marked slowdown in many industrialized countries of the west," due to "increasingly high prices of energy that are squeezing demand. Now, the question is: would that lead to blackouts? In short, I think not—not in the short run, at least... Right now, the industrial sector of several western countries is rapidly contracting and the result is reduced consumption. So, right now, as long as things evolve slowly, I would say that I don't see a blackout danger anywhere in Europe. We should see a gradual reduction of consumption as people become poorer and poorer, and less and less able to afford to pay the electricity bill."

So whether we face a future of increasing blackouts or declining consumption, the climbing costs of keeping the lights on means more of us might be switching off. But clearly that doesn't need to be the final verdict: increasing investments in installing smart grids now could prepare us for increased electricity demand in the future.

"This means that serious questions will have to be asked at both the individual and collective level concerning what we want and what we need," conclude Byrd and Matthewman in their study, "balancing what is good for us with what is good for others and ultimately what is good for the environment."

Perhaps, then, the biggest threat to the grid is us—and our insatiable appetite for more.

Nafeez Ahmed, Ph.D. is an investigative journalist and international security scholar. He is author of A User's Guide to the Crisis of Civilization (<http://crisisofcivilization.com>) and the sci-fi thriller, Zero Point (<http://zro.pt/>).

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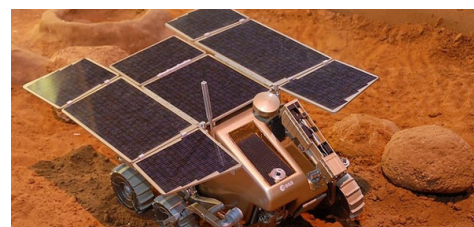
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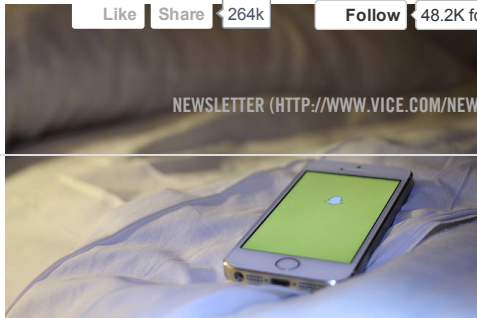
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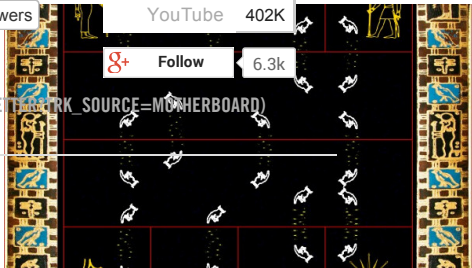
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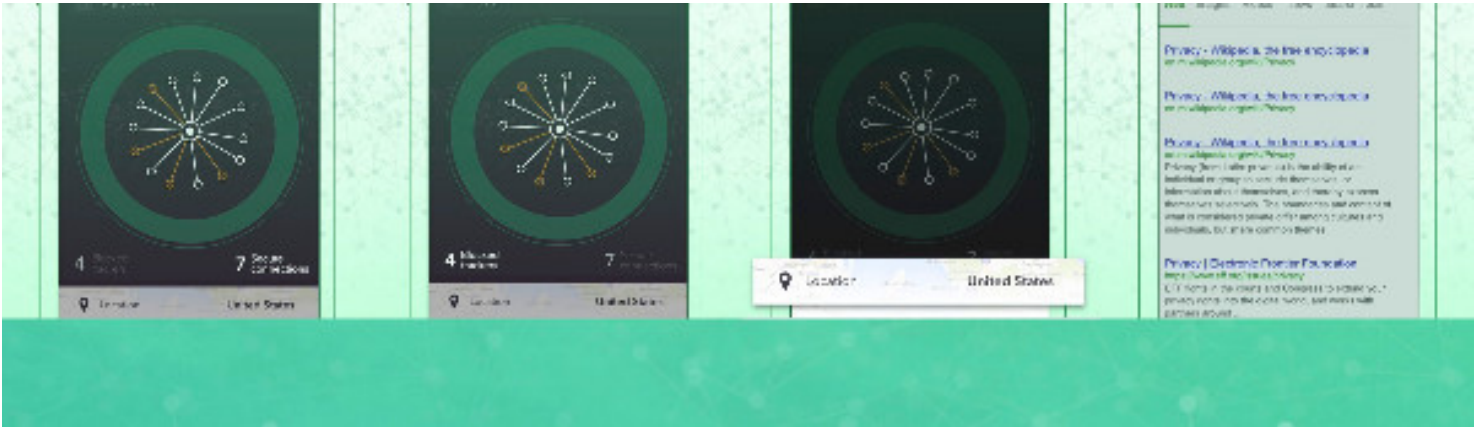
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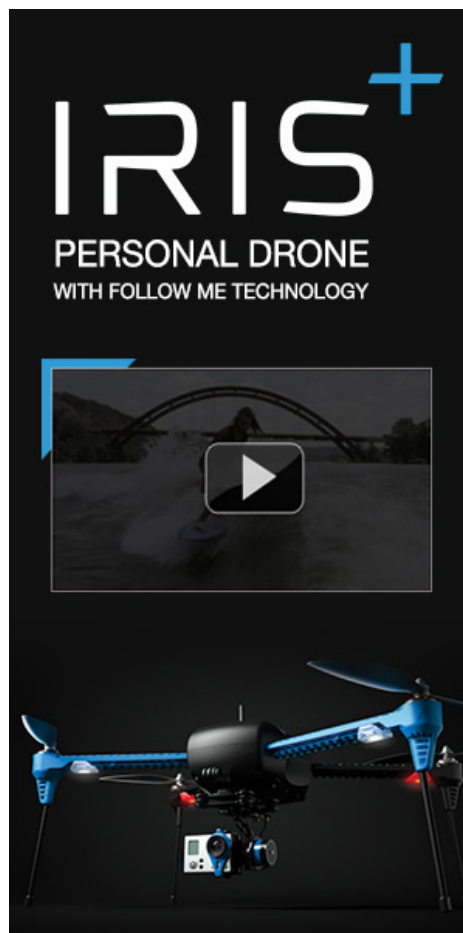
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rhailssrpe • 6 hours ago

The disaster on which to focus, is not the run of the mill falling tree taking out a power line, or even an exploding substation transformer. This are cured in a few hours, and the smart grid can tell the central office where the problem is, within a few feet. In the old days, a trucker drove the highways, looking up. The biggie is an outage caused by major generation plants destroying themselves, and possibly others. That outage will be measured in years of black or brown outs. As our electric infrastructure rots, due to the direct attacks by federal regulators, that unknown day draws closer. We use many old generating plants which are junk status, because we need them.

Nukes and fossil fueled power plants are designed to be tough. They are designed to take the hurricane, flood, earthquake, or blizzard, and produce power. In many hurricanes, the power plant survived but its load was destroyed. Hurricane Andrew hit two nukes and two fossil plants in the nose; they were sited on the beach. Per regulations, as the monster Cat 5 approached, they orderly shut down, for safety reasons. After the storm, they were left to rot, and provided a '50' southern exposure' to the sun. As a shattered community, the Golden

safety reasons. After the storm, they roared back to life and provided a life saving commodity, juice, to a shattered community. Consider the results if Andrew had hit square miles of wind generators, or solar panels. Or a sub zero blizzard, dumping three feet of snow. Would the city survive? No water, sewerage treatment, even hospital emergency power after a few hours, when the fuel tanks are drained.

Suppose the disaster is "helped" by foreign hackers who do not love us.

Some US city is going to find out.

1 ^ | v • Reply • Share >



witsendnj • 9 hours ago

so far, MOST blackouts from "extreme weather events" are directly related to trees falling over, which is actually because they dying from absorbing air pollution. Tropospheric ozone is invisible but the persistent background concentration is rising and it is highly toxic to all living things, ESPECIALLY vegetation. It is causing trees that are damaged season after season to rot inside, which is often plainly visible when they fall over or branches break off in storms. See: <http://scienceblogs.com/gregla...>

1 ^ | v • Reply • Share >



Fryin Berry → witsendnj • 8 hours ago

The troposphere is beginning at 12 km above the Earth's surface and beyond, so the claim that the "tropospheric ozone is toxic to living things" has to be clarified.

2 ^ | v • Reply • Share >



witsendnj → Fryin Berry • 7 hours ago

I did leave a link which explains it exhaustively (and, google is your friend) but to make it easy, from NOAA: "The remaining ozone is in the lower region of the atmosphere, which is commonly called the troposphere. The figure (above) shows an example of how ozone is distributed in the atmosphere. At the Earth's surface, ozone comes into direct contact with life-forms and displays its destructive side (hence, it is often called "bad ozone"). Because ozone reacts strongly with other molecules, high levels of ozone are toxic to living systems. Several studies have documented the harmful effects of ozone on crop production, forest growth, and human health." <http://www.ozonelayer.noaa.gov...>

1 ^ | v • Reply • Share >



GaelanClark → witsendnj • 7 hours ago

Ohhh, I see...you are wits end...WOW! You link to yourself as proof to something you say?

Anyway, another link is to this pdf where it is inferred that the ozone = killing our trees link is made...

<http://www.nature.nps.gov/air/...>

Under the "Ozone" header on pages 11 and 12 of the pdf there are many "could"s and "can"s along with this brilliant kicker... "suggesting that measurable ozone impact is plausible".

WOW, stop the presses....because it is....wait for it....."plausible."

It is plausible that if the Queen had a set of nads, she would be the King!

^ | v • Reply • Share >



GaelanClark → witsendnj • 7 hours ago

So I went to the blog that you highlighted above in order to elucidate myself to the ozone problem you indicated. The blog highlights an article in Science Magazine which substantially undercuts the narrative within the blog article itself...that being..."Virtually all current orthodox articles and studies blame climate change or alien species."---note the additional "or alien species"--WOW, climate change OR alien species!!!!

Let us stick with "climate change" as the meme, because any good liberal will, and so does the above article to which we are all commenting.

The link, which is in the

"3. Scientific Evidence that Trees are Dying – Across Species, Ages and Locations"

and further located here "The most recent study published"....is actually broken and goes to a "Wit's End" blog. I wonder why.

The actual article is located here...

<http://www.sciencemagazinedigi...>

and mentions both climate change and ozone ZERO times. Indeed, the article mentions many reasons why tree stands are dying and none of them have to do with ozone....or climate change.

The BS meter is out and it is pegged at the 100%.

^ | v • Reply • Share >



Justin Ratcliff • 2 hours ago

Don't we want reduced consumption? Electricity has only been in our lives a very short time, so it's well established that we can live

without it, and in point of fact, our reliance upon electricity is an obvious vulnerability. We need to find the middle ground on this issue, and that almost certainly demands we cut way back on consumption, and invest in "smart" technologies that help us accomplish this.

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